(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 193 891 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
28.12.2005 Bulletin 2005/52

(51) Int Cl.[7]: **H04B 7/02**

(21) Application number: **01308412.4**

(22) Date of filing: **02.10.2001**

(54) **Mobile communication system, base station, mobile station and mobile communication control method**

Mobilkommunikationssystem, Basisstation, Mobilstation und Steuerungsverfahren für Mobilkommunikation

Système de communication mobile, station de base, station mobile et procédé de gestion de communication mobile

(84) Designated Contracting States:
DE GB

(30) Priority: **02.10.2000 JP 2000302734**

(43) Date of publication of application:
03.04.2002 Bulletin 2002/14

(73) Proprietor: **NTT DoCoMo, Inc.**
Tokyo 100-6150 (JP)

(72) Inventors:
- **Tsutsumi, Noriyuki**
  Yokohama-shi, Kanagawa 232-0016 (JP)
- **Kato, Hidenari**
  Yokosuka-shi, Kanagawa 239-0807 (JP)
- **Takeshita, Hisashi**
  Yokoham-shi, Kanagawa 236-0031 (JP)
- **Ito, Shogo**
  Yokohama-shi, Kanagawa 235-0033 (JP)

(74) Representative:
Beresford, Keith Denis Lewis et al
BERESFORD & Co.
16 High Holborn
London WC1V 6BX (GB)

(56) References cited:
EP-A- 1 049 349
WO-A-00/38455
WO-A-00/54540
US-A- 5 926 470
US-A- 5 933 787

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 1 193 891 B1

Printed by Jouve, 75001 PARIS (FR)

Description

[0001] The present invention relates to a mobile communication system, base station, mobile station and mobile communication control method.

[0002] A threshold value associated with DHO (diversity handover) in conventional mobile communication is defined in a mobile station as a value common to all base stations.

[0003] Fig. 1 is a diagram illustrating a conventional method for deciding a DHO addition candidate (a candidate of a base station with which a mobile station will start new communication). Let us assume here that a base station always transmit a reference signal (such as a perch signal, for example) at fixed transmission power in addition to a signal for communicating with a mobile station. In Fig. 1, the vertical axis represents received powers of perch signals by a mobile station. A mobile station always measures received powers of perch signals from base stations, and decides a DHO addition threshold value as follows. It selects the highest received power among received powers of perch signals from multiple base stations (or a single base station) which are currently in communication with the mobile station as a reference value, and determines the received power lower than the reference value by X0 dB as the DHO addition threshold value. When a base station in non-communication (a base station which is currently not in communication with the mobile station) provides perch received power (received power of perch signal) equal to or greater than the DHO addition threshold value, the base station is selected as a DHO addition candidate. As for the example of Fig. 1, since the perch received power of the base station B is greater than the DHO addition threshold value, the base station B is selected as a DHO addition candidate. On the other hand, since the perch received power of the base station C is less than the addition threshold value, the base station C is not selected as a DHO addition candidate.

[0004] Fig. 2 is a diagram illustrating a conventional method for deciding a DHO deletion candidate (a candidate of a base station with which a mobile station will stop current communication). A mobile station always measures received powers of perch signals from base stations, and decides a DHO deletion threshold value as follows. It selects the highest received power (V_A in the example of Fig. 2) among received powers of perch signals from multiple base stations (or a single base station) which are currently in communication with the mobile station as a reference value, and determines the received power lower than the reference value by Y0 dB as the DHO deletion threshold value. When a base station in communication provides perch received power equal to or less than the DHO deletion threshold value, the base station is selected as a DHO deletion candidate. As for the example of Fig. 2, since the perch received power V_C of the base station C is less than the deletion threshold value, the base station C is selected as a DHO deletion candidate. On the other hand, since the perch received power V_B of the base station B is greater than the deletion threshold value, the base station B is not selected as a DHO deletion candidate.

[0005] Fig. 3 is a diagram illustrating an example of deciding a DHO addition candidate in conventional control. First, let us assume that a mobile station 10 is present in the (service) area of a base station 20, and is communicating only with the base station 20. The mobile station 10 calculates the DHO addition threshold value using the value X0 dB sent from the base station 20. The mobile station 10 ignores another value X1 dB (< X0 dB) a base station 30 may send for the mobile station to calculate the DHO addition threshold value. Here, assume that the mobile station 10 is moving toward the base station 30. When the mobile station 10 approaches the base station 30 to a certain distance, the perch received power of the base station 30 exceeds the DHO addition threshold value. In Fig. 3, the reference numeral 32 designates an area where the perch received power of the base station 30 exceeds the DHO addition threshold value, and 31 designates the radius of the area 32. Thus, when the mobile station 10 enters the area 32, the base station 30 becomes a DHO addition candidate. Incidentally, if the base station 20 sends the value X1 dB for the mobile station to calculate the DHO addition threshold value, and the mobile station 10 calculates the DHO addition threshold value using the value, the base station 30 becomes a DHO addition candidate when the mobile station 10 enters an area 34.

[0006] Fig. 4 is another diagram illustrating an example of deciding a DHO addition candidate in conventional control. First, let us assume that the mobile station 10 is present in the (service) area of the base station 30, and is communicating only with the base station 30. The mobile station 10 calculates the DHO addition threshold value using the value X1 dB sent from the base station 30. The mobile station 10 ignores another value X0 dB the base station 20 may send for the mobile station to calculate the DHO addition threshold value. Here, assume that the mobile station 10 is moving toward the base station 20. When the mobile station 10 approaches the base station 20 to a certain distance, the perch received power of the base station 20 exceeds the DHO addition threshold value. In Fig. 4, the reference numeral 24 designates an area where the perch received power of the base station 20 exceeds the DHO addition threshold value, and 23 designates the radius of the area 24. Thus, when the mobile station 10 enters the area 24, the base station 20 becomes a DHO addition candidate. Incidentally, if the base station 30 sends the value X0 dB for the mobile station to calculate the DHO addition threshold value, and the mobile station 10 calculates the DHO addition threshold value using the value, the base station 20 becomes a DHO addition candidate when the mobile station 10 enters an area 22.

[0007] As for decision of a DHO deletion candidate, it is analogous to that of a DHO addition candidate.

[0008] As described above, threshold values associated with DHO in conventional mobile communication are defined in a mobile station such that they are common to all the base stations. They are not varied in real time in response to the operation of each base station. Therefore, it is impossible for a base station to overcome a shortage of the radio channel capacity even if this is possible by varying DHO addition threshold value to reduce the number of DHO branch connections of the base station when the radio channel capacity is not enough. Likewise, it is impossible for a base station to overcome a shortage of the radio channel capacity even if this is possible by varying DHO deletion threshold value to release DHO branch or branches connected to the base station.

[0009] WO 00/54540 discloses a soft handoff arrangement in a CDMA mobile communication system in which a radio network controller (RNC) linked to a network of base stations directs a mobile station to add or delete sectors (service areas) to or from the service areas that the mobile station is simultaneously communicating with.

[0010] WO 00/38455 discloses a soft handoff arrangement in a mobile communication system in which the same best quality threshold values add_th and delete_th are used to identify addition and deletion candidates for sectors to be added or deleted from the current active set for the mobile station.

[0011] Therefore, it is an object of the present invention to secure radio channel capacity by setting information about diversity handover of each service area of base stations so that a mobile station can decide for each service area whether the service area is to be selected as a candidate of a service area in which the mobile station will start new communication, and/or as a candidate of a service area in which the mobile station will stop current communication.

[0012] According to a first aspect of the present invention, there is provided a mobile communication system including one or more base stations each of which has one or more service areas, and a mobile station, characterized in that each of said base stations comprises: means for transmitting information about diversity handover of each service area to said mobile station; and means for transmitting in each service area a reference signal to said mobile station, and said mobile station comprises: means for receiving said information about the diversity handover from the base station; means for receiving said reference signal from the base station, and for measuring its received quality; and means for making, for each service area, a decision as to whether the service area is to be selected as a candidate of a service area in which said mobile station will start a new communication, and/or as a candidate of a service area in which said mobile station will stop the current communication, in response to the received quality of the reference signal of the service area and the information about the diversity handover of the service area.

[0013] Here, each of the base stations may further comprise means for measuring for each service area an uplink interference amount to the base station, and wherein the information about the diversity handover may be determined in response to the uplink interference amount.

[0014] According to a second aspect of the present invention, there is provided a base station having one or more service areas, said base station being characterized by comprising: means for measuring for each service area an uplink interference amount to said base station; means for transmitting information about diversity handover of each service area determined in response to said uplink interference amount to said mobile station; and means for transmitting in each service area a reference signal to said mobile station.

[0015] According to a third aspect of the present invention, there is provided a mobile station characterized by comprising: means for receiving, from one or more base stations each of which has one or more service areas, information about diversity handover of each service area; means for receiving for each service area a reference signal from the base station, and for measuring its received quality; and means for making, for each service area, a decision as to whether the service area is to be selected as a candidate of a service area in which said mobile station will start a new communication, and/or as a candidate of a service area in which said mobile station will stop the current communication, in response to the received quality of the reference signal of the service area and the information about the diversity handover of the service area.

[0016] According to a fourth aspect of the present invention, there is provided a mobile communication control method in a mobile communication system including one or more base stations each of which has one or more service areas, and a mobile station, said mobile communication control method being characterized by comprising the steps of: transmitting information about diversity handover of each service area from a base station to said mobile station; transmitting in each service area a reference signal from the base station to said mobile station;

measuring received quality of said reference signal of each service area at said mobile station; and making at said mobile station, for each service area, a decision as to whether the service area is to be selected as a candidate of a service area in which said mobile station will start new communication, and/or as a candidate of a service area in which said mobile station will stop current communication, in response to the received quality of the reference signal of the service area and the information about the diversity handover of the service area.

[0017] Here, the mobile communication control method may further comprise the step of measuring at each of the base stations, for each service area, an uplink

interference amount to the base station, wherein the information about the diversity handover may be determined in response to the uplink interference amount.

[0018] According to the foregoing configuration, radio channel capacity can be secured by setting information about diversity handover of each service area of base stations so that a mobile station can decide for each service area whether the service area is to be selected as a candidate of a service area in which the mobile station will start new communication, and/or as a candidate of a service area in which the mobile station will stop current communication.

[0019] The above and other objects, effects, features and advantages of the present invention will become more apparent from the following description of embodiments thereof taken in conjunction with the accompanying drawings.

Fig. 1 is a diagram illustrating a conventional method for deciding a DHO addition candidate;
Fig. 2 is a diagram illustrating a conventional method for deciding a DHO deletion candidate;
Fig. 3 is a diagram illustrating an example of deciding a DHO addition candidate in conventional control;
Fig. 4 is a diagram illustrating another example of deciding a DHO addition candidate in conventional control;
Fig. 5 is a diagram illustrating a method for deciding a DHO addition candidate in accordance with the present embodiment;
Fig. 6 is a flowchart illustrating an example of processing for deciding a DHO addition candidate in a mobile station;
Fig. 7 is a diagram illustrating a method for deciding a DHO deletion candidate in accordance with the present embodiment;
Fig. 8 is a flowchart illustrating an example of processing for deciding a DHO deletion candidate in a mobile station;
Fig. 9 is a diagram illustrating an example of configuration of a base station;
Fig. 10 is a diagram illustrating an example of configuration of a mobile station; and
Fig. 11 is a diagram illustrating an example of deciding a DHO addition candidate in control of the present embodiment.

[0020] An embodiment of the present invention will now be described in detail with reference to the accompanying drawings. The present embodiment is described by way of example where each base station has a single service area.

[0021] Fig. 5 is a diagram illustrating a method for deciding a DHO addition candidate in accordance with the present embodiment, and Fig. 6 is a flowchart illustrating an example of processing for deciding a DHO addition candidate in a mobile station. Let us assume here that a base station always transmit a reference signal (a perch signal in the present embodiment) at a fixed transmission power in addition to a signal for communicating with a mobile station. In Fig. 5, the vertical axis represents received powers of perch signals by a mobile station. A mobile station always measures received powers of perch signals from base stations (step S101), and decides a DHO addition threshold value as follows. It selects the highest received power among received powers of perch signals from multiple base stations (or a single base station) which are currently in communication with the mobile station as a reference value, and determines the received power lower than the reference value by X dB as the DHO addition threshold value. Here, the value X differs from base station to base station. Each base station transmits its own value X to the mobile station (step S102). The value X can be transmitted with including it in the perch signal, for example. The mobile station stores the value X for each base station (service area), and carries out control for each base station (service area) using the value X of the base station (service area) (step S103).

[0022] In the example as shown in Fig. 5, V_A is the highest received power among the perch received powers of the base stations in communication. When the value X_B, the value X of the base station B in non-communication, is X_0, the DHO addition threshold value is To. Since V_B is greater than T_0, the base station B (or its service area) becomes a DHO addition candidate. When the value X_B is X_2, the base station B also becomes a DHO addition candidate. However, when the value X_B is X_1, since the value V_B is less than the DHO addition threshold value T_1, the base station B does not become a DHO addition candidate. As for the base station C in non-communication, when the value X_C, the value X of the base station C, is X_2, the base station C becomes a DHO addition candidate. However, when the value X_C is X_0 or X_1, the base station C does not become a DHO addition candidate.

[0023] Each base station can adjust the number of mobile stations connected to the base station by varying the value X. When the radio channel capacity is not enough, it can reduce the number of mobile stations connected thereto by reducing the value X. The base station can determine the value X by measuring an uplink interference amount to the base station.

[0024] Fig. 7 is a diagram illustrating a method for deciding a DHO deletion candidate in accordance with the present embodiment, and Fig. 8 is a flowchart illustrating an example of processing for deciding a DHO deletion candidate in a mobile station. A mobile station always measures received powers of perch signals from base stations (step S201), and decides a DHO deletion threshold value as follows. It selects the highest received power among received powers of perch signals from multiple base stations (or a single base station) which are currently in communication with the mobile station as a reference value, and determines the re-

ceived power lower than the reference value by Y dB as the DHO deletion threshold value. Here, the value Y differs from base station to base station. Each base station transmits its own value Y to the mobile station (step S202). The value Y can be transmitted with including it in the perch signal, for example. The mobile station stores the value Y for each base station (service area), and carries out control for each base station (service area) using the value Y of the base station (service area) (step S203).

[0025] In the example as shown in Fig. 7, V_A is the highest received power among the perch received powers of the base stations in communication. When the value Y_C, the value Y of the base station C in communication, is Y_0, the DHO deletion threshold value is T_0. Since V_C is less than T_0, the base station C (or its service area) becomes a DHO deletion candidate. When the value Y_C is Y_1, the base station C also becomes a DHO deletion candidate. However, when the value Y_C is Y_2, since the value V_C is greater than the DHO deletion threshold value T_2, the base station C does not become a DHO deletion candidate. As for the base station B in communication, when the value Y_B, the value Y of the base station B, is Y_1, the base station B becomes a DHO deletion candidate. However, when the value Y_B is Y_0 or Y_2, the base station B does not become a DHO deletion candidate.

[0026] Each base station can adjust the number of mobile stations connected to the base station by varying the value Y. When the radio channel capacity is not enough, it can reduce the number of mobile stations connected thereto by reducing the value Y. The base station can determine the value Y by measuring an uplink interference amount to the base station.

[0027] Fig. 9 is a diagram illustrating an example of configuration of a base station. A base station 120 comprises a communication section 141, a communication signal generation section 142, a perch signal generation section 143, a DHO information generation section 144, an interference amount measurement section 145, and a communication signal analysis section 146. The base station 120 communicates with a mobile station by transmitting and receiving communication signals. A communication signal generated at the communication signal generation section 142 is transmitted to the mobile station via the communication section 141. A communication signal received from the mobile station via the communication section 141 is analyzed at the communication signal analysis section 146. The base station 120 generates a perch signal at the perch signal generation section 143 and transmits it to the mobile station via the communication section 141. The perch signal includes information (the above mentioned values X and Y) about DHO generated at the DHO information generation section 144. The DHO information generation section 144 generates the information about DHO in accordance with a uplink interference amount measured at the interference amount measurement section 145.

[0028] Fig. 10 is a diagram illustrating an example of configuration of a mobile station. A mobile station 110 comprises a communication section 111, a communication signal generation section 112, a communication signal analysis section 116, a perch signal analysis section 117, a received power measurement section 118, and a DHO addition/deletion candidate decision section 119. The mobile station 110 communicates with a base station by transmitting and receiving communication signals. A communication signal generated at the communication signal generation section 112 is transmitted to the base station via the communication section 111. A communication signal received from the base station via the communication section 111 is analyzed at the communication signal analysis section 116. The mobile station 110 analyzes a perch signal received from the base station via the communication section 111 at the perch signal analysis section 117, and obtains information about DHO included in the perch signal. A received power of the perch signal is measured at the received power measurement section 118. The DHO addition/deletion candidate decision section 119 decide whether the base station (service area) which transmitted the perch signal is to be selected as a DHO addition candidate and whether the base station (service area) which transmitted the perch signal is to be selected as a DHO deletion candidate in accordance with the obtained information about DHO and the measured received power. If the base station is selected as a DHO addition candidate, the mobile station 110 informs the base station of the selection by using a communication signal, and carries out processing for DHO addition with the base station. If the base station is selected as a DHO deletion candidate, the mobile station 110 informs the base station of the selection by using a communication signal, and carries out processing for DHO deletion with the base station.

[0029] Fig. 11 is a diagram illustrating an example of deciding a DHO addition candidate in control of the present embodiment. An example of configuration of a base station 130 is the same as the base station 120 (Fig. 9). First, let us assume that the mobile station 110 is present in the (service) area of the base station 120, and is communicating only with the base station 120. The mobile station 110 calculates the DHO addition threshold value of the base station 120 using the value X0 dB sent from the base station 120. The mobile station 110 also calculates the DHO addition threshold value of the base station 130 using the value X1 dB (< X0 dB) sent from the base station 130. Here, assume that the mobile station 110 is moving toward the base station 130. When the mobile station 110 approaches the base station 130 to a certain distance, the perch received power of the base station 130 exceeds the DHO addition threshold value of the base station 130. In Fig. 11, the reference numeral 134 designates an area where the perch received power of the base station 130 exceeds

the DHO addition threshold value of the base station 130, and 133 designates the radius of the area 134. Thus, when the mobile station 110 enters the area 134, the base station 130 becomes a DHO addition candidate. Incidentally, if the base station 130 sends the value X0 dB for the mobile station to calculate the DHO addition threshold value, and the mobile station 110 calculates the DHO addition threshold value of the base station 130 using the value, the base station 130 becomes a DHO addition candidate when the mobile station 110 enters an area 132.

[0030] Next, let us assume that the mobile station 110 is present in the (service) area of a base station 130, and is communicating only with the base station 130. The mobile station 110 calculates the DHO addition threshold value of the base station 130 using the value X1 dB sent from the base station 130. The mobile station 110 also calculates the DHO addition threshold value of the base station 120 using the value X0 dB sent from the base station 120. Here, assume that the mobile station 110 is moving toward the base station 120. When the mobile station 110 approaches the base station 120 to a certain distance, the perch received power of the base station 120 exceeds the DHO addition threshold value of the base station 120. In Fig. 11, the reference numeral 122 designates an area where the perch received power of the base station 120 exceeds the DHO addition threshold value of the base station 120, and 121 designates the radius of the area 122. Thus, when the mobile station 110 enters the area 122, the base station 120 becomes a DHO addition candidate. Incidentally, if the base station 120 sends the value X1 dB for the mobile station to calculate the DHO addition threshold value, and the mobile station 110 calculates the DHO addition threshold value of the base station 120 using the value, the base station 120 becomes a DHO addition candidate when the mobile station 110 enters an area 124.

[0031] As for decision of a DHO deletion candidate, it is analogous to that of a DHO addition candidate.

[0032] Although the present embodiment makes a decision of a DHO addition candidate and a DHO deletion candidate using a received power of a perch signal. However, for example, it is possible to use other indices indicating received quality of a perch signal such as a propagation loss (a transmission power of a perch signal minus a received power of the perch signal) and a received SIR (Signal-to-Interference power Ratio) to decide a DHO addition candidate and a DHO deletion candidate. The transmission power of the perch signal may be fixed, or information about it can be transmitted to a mobile station with including it in the perch signal.

[0033] Although the foregoing description is made by way of example where each base station has a single service area, the present invention is applicable to a case where a base station has two or more service areas. In that case, the base station transmits to a mobile station information about the diversity handover of each service area, and a reference signal in each service area. The mobile station measures for each service area a received power, a propagation loss, a received SIR and the like of the reference signal, and makes a decision for each service area as to whether the service area is to be selected as a candidate of a service area in which the mobile station will start new communication (DHO addition candidate), and/or as a candidate of a service area in which the mobile station will stop current communication (DHO deletion candidate).

[0034] As an example where a single base station has two or more service areas, the base station can have six sectors (service areas) of 60 (=360/6) degrees. In configuration of areas of mobile telephony, six sectors of 60 degrees or three sectors of 120 degrees are widely used.

[0035] As described above, according to the present invention, radio channel capacity can be secured by setting information about diversity handover of each service area of base stations so that a mobile station can decide for each service area whether the service area is to be selected as a candidate of a service area in which the mobile station will start new communication, and/or as a candidate of a service area in which the mobile station will stop current communication.

[0036] The present invention has been described in detail with respect to preferred embodiments, and it will now be apparent from the foregoing to those skilled in the art that changes and modifications may be made without departing from the invention in its broader aspects, and it is the intention, therefore, in the appended claims to cover all such changes and modifications as fall within the true spirit of the invention.

Claims

1. A mobile communication system including one or more base stations (120, 130) each of which has one or more service areas (122, 124; 132, 134), and a mobile station (110), **characterized in that**

   each of said base stations (120, 130) comprises:

   means for transmitting (141, 144) information about diversity handover of each service area to said mobile station (110); and
   means for transmitting (141) in each service area a reference signal to said mobile station (110), and

   said mobile station (110) comprises:

   means for receiving (111) said information about the diversity handover from the base station (120, 130);
   means for receiving (111) said reference signal from the base station (120, 130), and for meas-

uring (116, 117, 118) its received quality; and
means for making (119), for each service area, a decision as to whether the service area is to be selected as a candidate of a service area in which said mobile station (110) will start a new communication, and/or as a candidate of a service area in which said mobile station (110) will stop the current communication, in response to the received quality of the reference signal of the service area and the information about the diversity handover of the service area.

2. The mobile communication system as claimed in claim 1, wherein each of said base stations (120, 130) further comprises means for measuring (145) for each service area an uplink interference amount to the base station, wherein said information about the diversity handover is determined in response to said uplink interference amount.

3. The mobile communication system as claimed in claim 1, wherein
each of said base stations (120, 130) further comprises means for determining information about an addition threshold value and/or a deletion threshold value for diversity handover of each service area,
said means for transmitting (141) transmits said information about an addition threshold value and/or a deletion threshold value for diversity handover of each service area to said mobile station (110),
said means for receiving information (111) receives said information about an addition threshold value and/or a deletion threshold value for diversity handover from the base station (120, 130), and
said means for making a decision (119) makes, for each service area, a decision as to whether the service area is to be selected as a candidate of a service area in which said mobile station will start a new communication, and/or as a candidate of a service area in which said mobile station will stop the current communication, by comparing the received quality of the reference signal of the service area with an addition threshold value (T_2) and/or a deletion threshold value (T_1) obtained at the mobile station from information about an addition threshold value and/or a deletion threshold value for diversity handover of the service area.

4. A base station having one or more service areas, said base station being **characterized by** comprising:

means for measuring (145) for each service area an uplink interference amount to said base station;
means for transmitting (141, 144) information about diversity handover of each service area determined in response to said uplink interference amount to said mobile station (110); and
means for transmitting (141) in each service area a reference signal to said mobile station (110).

5. The base station as claimed in claim 4, wherein
said base station further comprises means for determining information (144) about an addition threshold value and/or a deletion threshold value for diversity handover of each service area in response to said uplink interference amount, and
said means for transmitting (141) transmits said information about an addition threshold value and/or a deletion threshold value for diversity handover of each service area to said mobile station (110).

6. A mobile station **characterized by** comprising:

means for receiving (111), from one or more base stations (120, 130) each of which has one or more service areas, information about diversity handover of each service area;
means for receiving for each service area a reference signal from the base station (120), and for measuring its received quality (116, 117, 118); and
means for making (119), for each service area, a decision as to whether the service area is to be selected as a candidate of a service area in which said mobile station will start a new communication, and/or as a candidate of a service area in which said mobile station will stop the current communication, in response to the received quality of the reference signal of the service area and the information about the diversity handover of the service area.

7. The mobile station as claimed in claim 6, wherein
said means for receiving information (111) receives information about an addition threshold value and/or a deletion threshold value for diversity handover of each service area, and
said means for making a decision (119) makes, for each service area, a decision as to whether the service area is to be selected as a candidate of a service area in which said mobile station will start a new communication, and/or as a candidate of a service area in which said mobile station will stop the current communication, by comparing the received quality of the reference signal of the service area with an addition threshold value and/or a deletion threshold value obtained at the mobile station from information about an addition threshold value and/or a deletion threshold value for diversity

handover of the service area.

8. A mobile communication control method in a mobile communication system including one or more base stations (120, 130) each of which has one or more service areas, and a mobile station (110), said mobile communication control method being **characterized by** comprising the steps of:

transmitting information about diversity handover of each service area from a base station (120, 130) to said mobile station (110);
transmitting in each service area a reference signal from the base station (120, 130) to said mobile station (110);
measuring received quality of said reference signal of each service area at said mobile station (S101); and
making at said mobile station (110), for each service area, a decision as to whether the service area is to be selected as a candidate of a service area in which said mobile station will start new communication, and/or as a candidate of a service area in which said mobile station will stop current communication, in response to the received quality of the reference signal of the service area and the information about the diversity handover of the service area (S103; S203).

9. The mobile communication control method as claimed in claim 8, further comprising the step of measuring at each of said base stations (120, 130), for each service area, an uplink interference amount to the base station, wherein said information about the diversity handover is determined in response to said uplink interference amount.

10. The mobile communication control method as claimed in claim 8, wherein

said mobile communication control method further comprises the step of determining information about an addition threshold value and/or a deletion threshold value for diversity handover of each service area at the base station (S103, S203),

said step of transmitting transmits said information about an addition threshold value and/or a deletion threshold value for diversity handover of each service area from the base station to said mobile station, and

said step of making a decision makes at said mobile station, for each service area, a decision as to whether the service area is to be selected as a candidate of a service area in which said mobile station will start new communication, and/or as a candidate of a service area in which said mobile station will stop current communication, by comparing the received quality of the reference signal of the service area with an addition threshold value (T_2) and/or a deletion threshold value obtained at the mobile station from information about an addition threshold value and/or a deletion threshold value for diversity handover of the service area.

Patentansprüche

1. Mobilkommunikationssystem mit einer oder mehreren Basisstationen (120, 130), von denen jede einen oder mehrere Dienstbereiche (122, 124; 132, 134) aufweist, und einer Mobilstation (110), **dadurch gekennzeichnet, dass**

jede der Basisstationen (120, 130) aufweist:

eine Einrichtung (141, 144) zum Übertragen von Informationen über eine Diversity-Weiterreichung jedes Dienstbereichs an die Mobilstation (110); und
eine Einrichtung (141) zum Übertragen eines Bezugssignals in jedem Dienstbereich an die Mobilstation (110), und

die Mobilstation (110) aufweist:

eine Einrichtung (111) zum Empfangen der Informationen über die Diversity-Weiterreichung von der Basisstation (120, 130);
eine Einrichtung (111) zum Empfangen des Bezugssignals von der Basisstation (120, 130) und eine Einrichtung (116, 117, 118) zum Messen dessen Empfangsqualität; und
eine Einrichtung (119) zum Treffen einer Entscheidung für jeden Dienstbereich darüber, ob der Dienstbereich als ein Kandidat eines Dienstbereichs auszuwählen ist, in dem die Mobilstation (110) eine neue Kommunikation beginnen wird, und/oder als ein Kandidat eines Dienstbereichs auszuwählen ist, in dem die Mobilstation (110) die aktuelle Kommunikation beenden wird, in Erwiderung auf die Empfangsqualität des Bezugssignals des Dienstbereichs und die Informationen über die Diversity-Weiterreichung des Dienstbereichs.

2. Mobilkommunikationssystem gemäß Anspruch 1, bei dem jede der Basisstationen (120, 130) zusätzlich eine Einrichtung (145) zum Messen eines Aufwärtsstrecken-Interferenzbetrags an die Basisstation für jeden Dienstbereich aufweist, wobei die Informationen über die Diversity-Weiterreichung in Erwiderung auf den Aufwärtsstrecken-Interferenzbetrag bestimmt werden.

3. Mobilkommunikationssystem gemäß Anspruch 1, bei dem

jede der Basisstationen (120, 130) zusätzlich

eine Einrichtung zum Bestimmen von Informationen über einen Hinzufügungsschwellenwert und/oder einen Löschungsschwellenwert für eine Diversity-Weiterreichung jedes Dienstbereichs aufweist,

die Einrichtung (141) zum Übertragen die Informationen über einen Hinzufügungsschwellenwert und/oder einen Löschungsschwellenwert für eine Diversity-Weiterreichung jedes Dienstbereichs an die Mobilstation (110) überträgt,

die Einrichtung (111) zum Empfangen von Informationen die Informationen über einen Hinzufügungsschwellenwert und/oder einen Löschungsschwellenwert für eine Diversity-Weiterreichung von der Basisstation (120, 130) empfängt, und

die Einrichtung (119) zum Treffen einer Entscheidung für jeden Dienstbereich eine Entscheidung darüber trifft, ob der Dienstbereich als ein Kandidat eines Dienstbereichs auszuwählen ist, in dem die Mobilstation eine neue Kommunikation beginnen wird, und/oder als ein Kandidat eines Dienstbereichs auszuwählen ist, in dem die Mobilstation die aktuelle Kommunikation beenden wird, indem die Empfangsqualität des Bezugssignals des Dienstbereichs mit einem Hinzufügungsschwellenwert (T_2) und/oder einem Löschungsschwellenwert (T_1) verglichen wird, der an der Mobilstation aus Informationen über einen Hinzufügungsschwellenwert und/oder einen Löschungsschwellenwert für eine Diversity-Weiterreichung des Dienstbereichs erhalten wird.

4. Basisstation mit einem oder mehreren Dienstbereichen, **gekennzeichnet durch**:

eine Einrichtung (145) zum Messen eines Aufwärtsstrecken-Interferenzbetrags an die Basisstation für jeden Dienstbereich;
eine Einrichtung (141, 144) zum Übertragen von Informationen über eine Diversity-Weiterreichung jedes Dienstbereichs, die in Erwiderung auf den Aufwärtsstrecken-Interferenzbetrag bestimmt werden, an die Mobilstation (110); und
eine Einrichtung (144) zum Übertragen eines Bezugssignals in jedem Dienstbereich an die Mobilstation (110).

5. Basisstation gemäß Anspruch 4, wobei

die Basisstation zusätzlich eine Einrichtung (144) zum Bestimmen von Informationen über einen Hinzufügungsschwellenwert und/oder einen Löschungsschwellenwert für eine Diversity-Weiterreichung jedes Dienstbereichs in Erwiderung auf den Aufwärtsstrecken-Informationsbetrag aufweist, und

die Einrichtung (141) zum Übertragen die Informationen über einen Hinzufügungsschwellenwert und/oder einen Löschungsschwellenwert für eine Diversity-Weiterreichung jedes Dienstbereichs an die Mobilstation (110) überträgt.

6. Mobilstation, **gekennzeichnet durch**:

eine Einrichtung (111) zum Empfangen von Informationen über eine Diversity-Weiterreichung jedes Dienstbereichs von einer oder mehreren Basisstationen (120, 130), von denen jede einen oder mehrere Dienstbereiche aufweist;
eine Einrichtung zum Empfangen eines Bezugssignals für jeden Dienstbereich von der Basisstation (120) und eine Einrichtung zum Messen dessen Empfangsqualität (116, 117, 118); und
eine Einrichtung (119) zum Treffen einer Entscheidung für jeden Dienstbereich darüber, ob der Dienstbereich als ein Kandidat eines Dienstbereichs auszuwählen ist, in dem die Mobilstation eine neue Kommunikation beginnen wird, und/oder als ein Kandidat eines Dienstbereichs auszuwählen ist, in dem die Mobilstation die aktuelle Kommunikation beenden wird, in Erwiderung auf die Empfangsqualität des Bezugssignals des Dienstbereichs und die Informationen über die Diversity-Weiterreichung des Dienstbereichs.

7. Mobilstation gemäß Anspruch 6, bei der

die Einrichtung (111) zum Empfangen von Informationen Informationen über einen Hinzufügungsschwellenwert und/oder einen Löschungsschwellenwert für eine Diversity-Weiterreichung jedes Dienstbereichs empfängt, und

die Einrichtung (119) zum Treffen einer Entscheidung für jeden Dienstbereich eine Entscheidung darüber trifft, ob der Dienstbereich als ein Kandidat eines Dienstbereichs auszuwählen ist, in dem die Mobilstation eine neue Kommunikation beginnen wird, und/oder als ein Kandidat eines Dienstbereichs auszuwählen ist, in dem die Mobilstation die aktuelle Kommunikation beenden wird, indem die Empfangsqualität des Bezugssignals des Dienstbereichs mit einem Hinzufügungsschwellenwert und/oder einem Löschungsschwellenwert verglichen wird, der an der Mobilstation aus Informationen über einen Hinzufügungsschwellenwert und/oder einen Löschungsschwellenwert für eine Diversity-Weiterreichung des Dienstbereichs erhalten wird.

8. Mobilkommunikationssteuerungsverfahren bei einem Mobilkommunikationssystem mit einer oder mehreren Basisstationen (120, 130), von denen jede einen oder mehrere Dienstbereiche aufweist, und einer Mobilstation (110), **gekennzeichnet durch** die Schritte:

Übertragen von Informationen über eine Diversity-Weiterreichung jedes Dienstbereichs von einer Basisstation (120, 130) an die Mobilstation (110);

Übertragen eines Bezugssignals in jedem Dienstbereich von der Basisstation (120, 130) an die Mobilstation (110);

Messen einer Empfangsqualität des Bezugssignals jedes Dienstbereichs an der Mobilstation (S101); und

Treffen einer Entscheidung an der Mobilstation (110) für jeden Dienstbereich darüber, ob der Dienstbereich als ein Kandidat eines Dienstbereichs auszuwählen ist, in dem die Mobilstation eine neue Kommunikation beginnen wird, und/oder als ein Kandidat eines Dienstbereichs auszuwählen ist, in dem die Mobilstation eine aktuelle Kommunikation beenden wird, in Erwiderung auf die Empfangsqualität des Bezugssignals des Dienstbereichs und die Informationen über die Diversity-Weiterreichung des Dienstbereichs (S103, S203).

9. Mobilkommunikationssteuerungsverfahren gemäß Anspruch 8, zusätzlich mit dem Schritt zum Messen eines Aufwärtsstrecken-Interferenzbetrags an die Basisstation an jeder der Basisstationen (120, 130) für jeden Dienstbereich, wobei die Informationen über die Diversity-Weiterreichung in Erwiderung auf den Aufwärtsstrecken-Interferenzbetrag bestimmt werden.

10. Mobilkommunikationssteuerungsverfahren gemäß Anspruch 8, wobei

das Mobilkommunikationssteuerungsverfahren zusätzlich den Schritt zum Bestimmen von Informationen über einen Hinzufügungsschwellenwert und/oder einen Löschungsschwellenwert für eine Diversity-Weiterreichung jedes Dienstbereichs an der Basisstation aufweist (S103, S203),

der Übertragungsschritt die Informationen über einen Hinzufügungsschwellenwert und/oder einen Löschungsschwellenwert für eine Diversity-Weiterreichung jedes Dienstbereichs von der Basisstation an die Mobilstation überträgt, und

der Schritt zum Treffen einer Entscheidung an der Mobilstation für jeden Dienstbereich eine Entscheidung darüber trifft, ob der Dienstbereich als ein Kandidat eines Dienstbereichs auszuwählen ist, in dem die Mobilstation eine neue Kommunikation beginnen wird, und/oder als ein Kandidat eines Dienstbereichs auszuwählen ist, in dem die Mobilstation eine aktuelle Kommunikation beenden wird, indem die Empfangsqualität des Bezugssignals des Dienstbereichs mit einem Hinzufügungsschwellenwert (T_2) und/oder einem Löschungsschwellenwert verglichen wird, der an der Mobilstation aus Informationen über einen Hinzufügungsschwellenwert und/oder einen Löschungsschwellenwert für eine Diversity-Weiterreichung des Dienstbereichs erhalten wird.

Revendications

1. Système de communication mobile comportant un ou plusieurs postes (120, 130) de base, chacun ayant une ou plusieurs zones (122, 124 ; 132, 134) de desserte et un poste (110) mobile, **caractérisé en ce que**

chacun des postes (120, 130) de base comporte :

des moyens (141, 144) destinés à émettre des informations concernant le transfert intercellulaire en diversité de chaque zone de desserte au poste (110) mobile ; et

des moyens (141) destinés à émettre dans chaque zone de desserte un signal de référence au poste (110) mobile, et

le poste (110) mobile comporte :

des moyens (111) destinés à recevoir l'information concernant le transfert intercellulaire en diversité du poste (120, 130) de base ;

des moyens (111) destinés à recevoir le signal de référence du poste (120, 130) de base, et destinés à mesurer (116, 117, 118) sa qualité reçue ; et

des moyens (119) destinés à prendre, pour chaque zone de desserte, une décision sur le point de savoir si oui ou non la zone de desserte doit être sélectionnée en tant que candidat d'une zone de desserte dans laquelle le poste (110) mobile va commencer une nouvelle communication, et/ou en tant que candidat d'une zone de desserte dans laquelle le poste (110) mobile va cesser la communication en cours, en réponse à la qualité reçue du signal de référence de la zone de desserte et de l'information concernant le transfert intercellulaire en diversité de la zone de desserte.

2. Système de communication mobile suivant la revendication 1, dans lequel chacun des postes (120, 130) de base comporte en outre des moyens (145) destinés à mesurer pour chaque zone de desserte une quantité d'interférences en liaison ascendante avec le poste de base, l'information concernant le transfert intercellulaire en diversité étant déterminée en réponse à la quantité d'interférences en liaison ascendante.

3. Système de communication mobile suivant la revendication 1, dans lequel chaque poste (120, 130)

de base comporte en outre des moyens destinés à déterminer une information concernant une valeur seuil d'addition et/ou une valeur seuil d'effacement pour le transfert intercellulaire en diversité de chaque zone de desserte,

les moyens (141) destinés à émettre émettent l'information concernant une valeur seuil d'addition et/ou une valeur seuil d'effacement pour le transfert intercellulaire en diversité de chaque zone de desserte vers le poste (110) mobile,

les moyens (111) destinés à recevoir des informations reçoivent l'information concernant une valeur seuil d'addition et/ou une valeur seuil d'effacement pour le transfert intercellulaire en diversité du poste (120, 130) de base, et

les moyens (119) destinés à prendre une décision prennent, pour chaque zone de desserte, une décision sur le point de savoir si oui ou non la zone de desserte doit être sélectionnée comme un candidat d'une zone de desserte dans laquelle le poste mobile va commencer une nouvelle communication, et/ou comme un candidat d'une zone de desserte dans laquelle le poste mobile va cesser la communication en cours, en comparant la qualité reçue du signal de référence de la zone de desserte avec une valeur (T_2) de seuil d'addition et/ou une valeur (T_1) de seuil d'effacement obtenue au poste mobile à partir d'information concernant une valeur seuil d'addition et/ou une valeur seuil d'effacement pour le transfert intercellulaire en diversité de là zone de desserte.

4. Poste de base ayant une ou plusieurs zones de dessertes, le poste de base étant **caractérisé par** le fait de comporter :

des moyens (145) destinés à mesurer pour chaque zone de desserte une quantité d'interférences en liaison ascendante vers le poste de base ;
des moyens (141, 144) destinés à émettre des informations concernant le transfert intercellulaire en diversité de chaque zone de desserte déterminées en réponse à la quantité d'interférences en liaison ascendante vers le poste (110) mobile ; et
des moyens (141) destinés à émettre dans chaque zone de desserte un signal de référence vers le poste (110) mobile.

5. Poste de base suivant la revendication 4, dans lequel

le poste de base comporte en outre des moyens (144) destinés à déterminer des informations concernant une valeur seuil d'addition et/ou une valeur seuil d'effacement pour le transfert intercellulaire en diversité de chaque zone de desserte en réponse à la quantité d'interférences en liaison ascendante, et

les moyens (141) destinés à émettre émettent l'information concernant une valeur seuil d'addition et/ou une valeur seuil d'effacement pour le transfert intercellulaire en diversité de chaque zone de desserte vers le poste (110) mobile.

6. Poste mobile **caractérisé par** le fait de comporter :

des moyens (111) destinés à recevoir, à partir d'un ou de plusieurs postes (120, 130) de base qui ont chacun une ou plusieurs zones de desserte, des informations concernant le transfert intercellulaire en diversité de chaque zone de desserte ;
des moyens destinés à recevoir pour chaque zone de desserte un signal de référence du poste (120, 130) de base, et pour mesurer sa qualité (116, 117, 118) reçue ; et
des moyens (119) destinés à prendre, pour chaque zone de desserte, une décision sur le point de savoir si oui ou non la zone de desserte doit être sélectionnée comme un candidat d'une zone de desserte dans laquelle le poste mobile va commencer une nouvelle communication, et/ou comme un candidat d'une zone de desserte dans laquelle le poste mobile va cesser la communication en cours, en réponse à la qualité reçue du signal de référence de la zone de desserte et de l'information concernant le transfert intercellulaire en diversité de la zone de desserte.

7. Poste mobile suivant la revendication 6, dans lequel

les moyens (111) destinés à recevoir des informations reçoivent des informations concernant une valeur seuil d'addition et/ou une valeur seuil d'effacement pour le transfert intercellulaire en diversité de chaque zone de desserte, et

les moyens (119) destinés à prendre une décision prennent, pour chaque zone de desserte, une décision sur le point de savoir si oui ou non la zone de desserte doit être sélectionnée comme un candidat d'une zone de desserte dans laquelle le poste mobile va commencer une nouvelle communication, et/ou comme un candidat d'une zone de desserte dans laquelle le poste mobile va cesser la communication en cours, en comparant la qualité reçue du signal de référence de la zone de desserte avec une valeur de seuil d'addition et/ou une valeur de seuil d'effacement obtenue au poste mobile à partir de l'information concernant une valeur seuil d'addition et/ou une valeur seuil d'effacement pour le transfert intercellulaire en diversité de la zone de desserte.

8. Procédé de commande de communication mobile dans un système de communication mobile com-

portant un ou plusieurs postes (120, 130) de base, qui ont chacun une ou plusieurs zones de desserte, et un poste (110) mobile, le procédé de commande de communication mobile étant **caractérisé par** le fait de comporter les étapes dans lesquelles :

on émet des informations concernant le transfert intercellulaire en diversité de chaque zone de desserte à partir d'un poste (120, 130) de base vers le poste (110) mobile ; et
on émet dans chaque zone de desserte un signal de référence à partir du poste (120, 130) de base vers le poste (110) mobile ;
on mesure (S101) la qualité reçue du signal de référence de chaque zone de desserte au poste mobile ; et
on prend au niveau du poste (110) mobile, pour chaque zone de desserte, une décision sur le point de savoir si oui ou non la zone de desserte doit être sélectionnée comme un candidat d'une zone de desserte dans laquelle le poste mobile va commencer une nouvelle communication, et/ou en tant que candidat d'une zone de desserte dans laquelle le poste mobile va cesser la communication en cours, en réponse à la qualité reçue du signal de référence de la zone de desserte et de l'information concernant le transfert intercellulaire en diversité de la zone de desserte (S103 ; S203).

9. Procédé de commande de communication mobile suivant la revendication 8, comportant en outre l'étape dans laquelle on mesure à chacun des postes (120, 130) de base, pour chaque zone de desserte, une quantité d'interférences en liaison ascendante vers le poste de base, dans lequel l'information concernant le transfert intercellulaire en diversité est déterminée en réponse à la quantité d'interférences en liaison ascendante.

10. Procédé de commande de communication mobile suivant la revendication 8, dans lequel

le procédé de commande de communication mobile comporte en outre l'étape qui consiste à déterminer (S103, S203) des informations concernant une valeur seuil d'addition et/ou une valeur seuil d'effacement pour le transfert intercellulaire en diversité de chaque zone de desserte au poste de base,

l'étape d'émission émet l'information concernant une valeur seuil d'addition et/ou une valeur seuil d'effacement pour le transfert intercellulaire en diversité de chaque zone de desserte à partir du poste de base vers le poste mobile, et

l'étape de prendre une décision prend au poste mobile, pour chaque zone de desserte, une décision sur le point de savoir si oui ou non la zone de desserte doit être sélectionnée comme un candidat pour la zone de desserte dans laquelle le poste mobile va commencer une nouvelle communication, et/ou comme un candidat pour une zone de desserte dans laquelle le poste mobile va cesser la communication en cours, en comparant la qualité reçue du signal de référence de la zone de desserte avec une valeur (T_2) de seuil d'addition et/ou une valeur seuil d'effacement obtenue au poste mobile à partir de l'information concernant une valeur seuil d'addition et/ou une valeur seuil d'effacement pour le transfert intercellulaire en diversité de la zone de desserte.

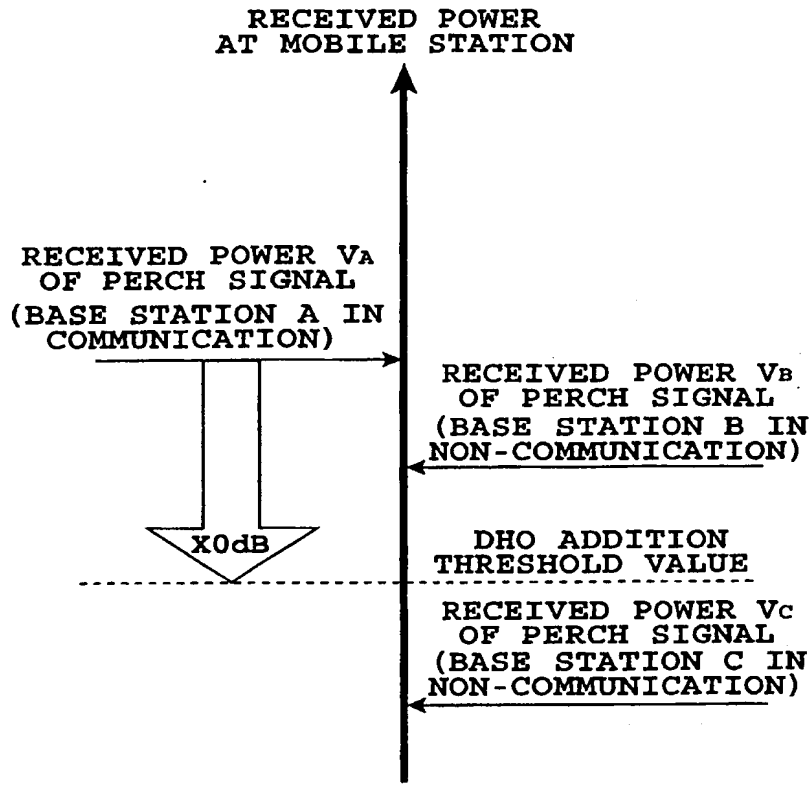
RECEIVED POWER AT MOBILE STATION
RECEIVED POWER VA OF PERCH SIGNAL (BASE STATION A IN COMMUNICATION)
RECEIVED POWER VB OF PERCH SIGNAL (BASE STATION B IN NON-COMMUNICATION)
X0dB
DHO ADDITION THRESHOLD VALUE
RECEIVED POWER VC OF PERCH SIGNAL (BASE STATION C IN NON-COMMUNICATION)

FIG.1

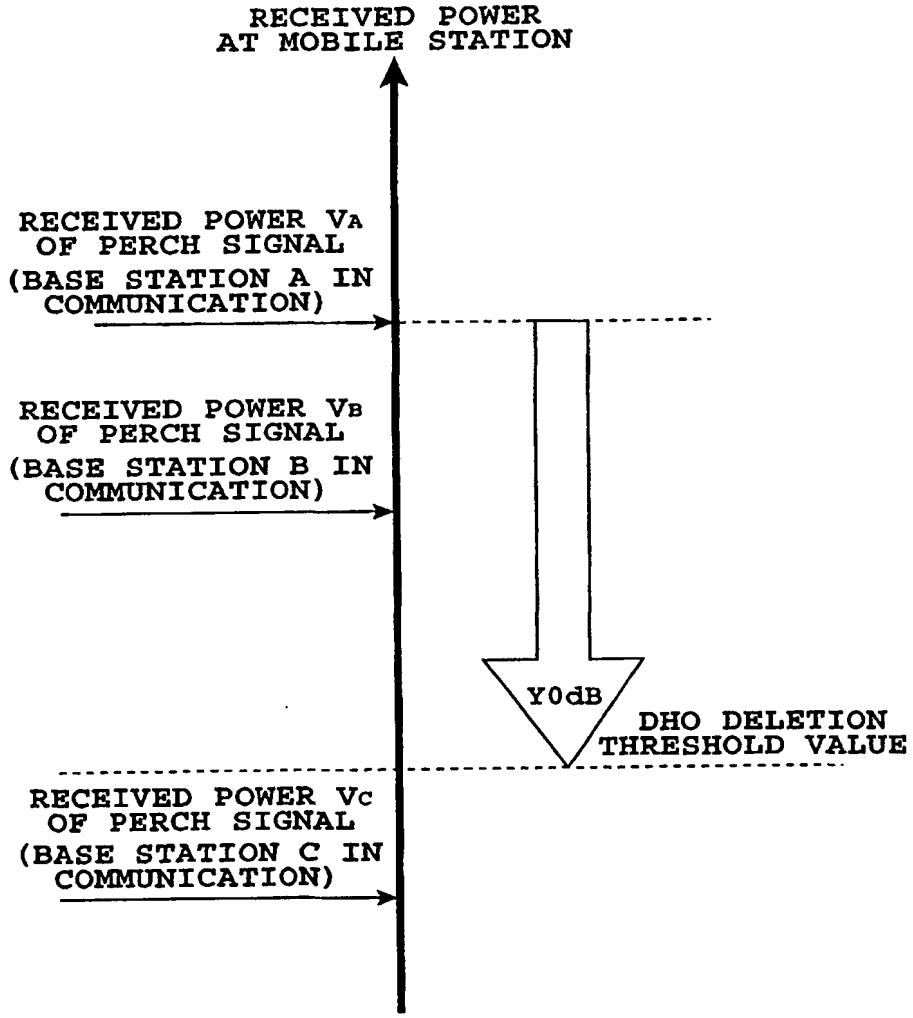
RECEIVED POWER AT MOBILE STATION
RECEIVED POWER VA OF PERCH SIGNAL (BASE STATION A IN COMMUNICATION)
RECEIVED POWER VB OF PERCH SIGNAL (BASE STATION B IN COMMUNICATION)
Y0dB
DHO DELETION THRESHOLD VALUE
RECEIVED POWER Vc OF PERCH SIGNAL (BASE STATION C IN COMMUNICATION)

FIG.2

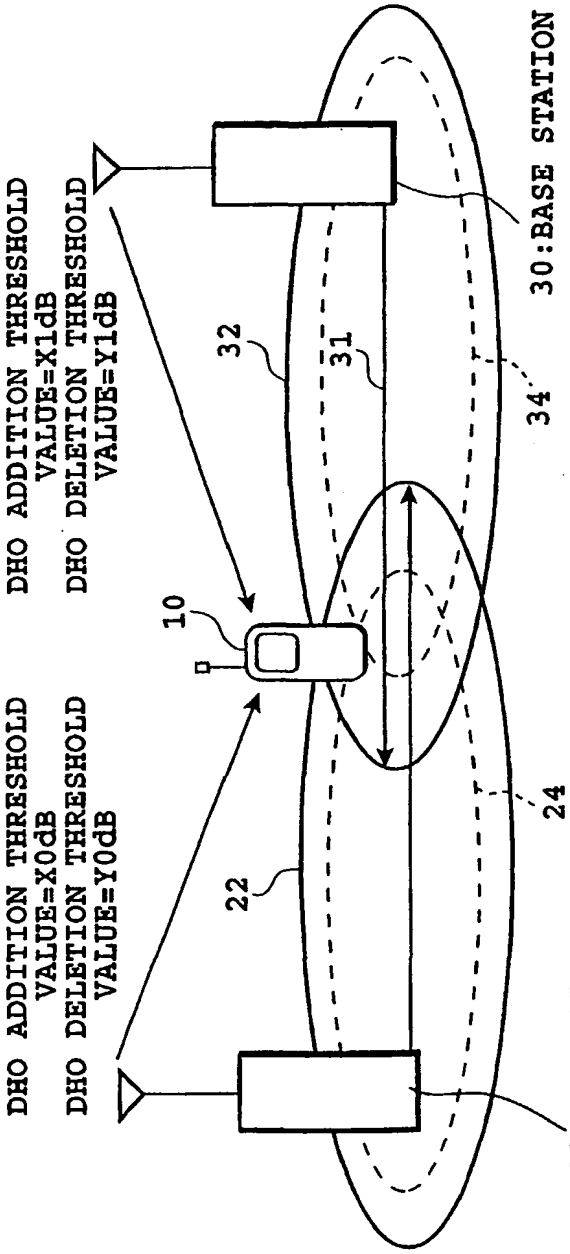
DHO ADDITION THRESHOLD VALUE=X1dB
DHO DELETION THRESHOLD VALUE=Y1dB
DHO ADDITION THRESHOLD VALUE=X0dB
DHO DELETION THRESHOLD VALUE=Y0dB
10
20:BASE STATION
22
24
30:BASE STATION
31
32
34

FIG.3

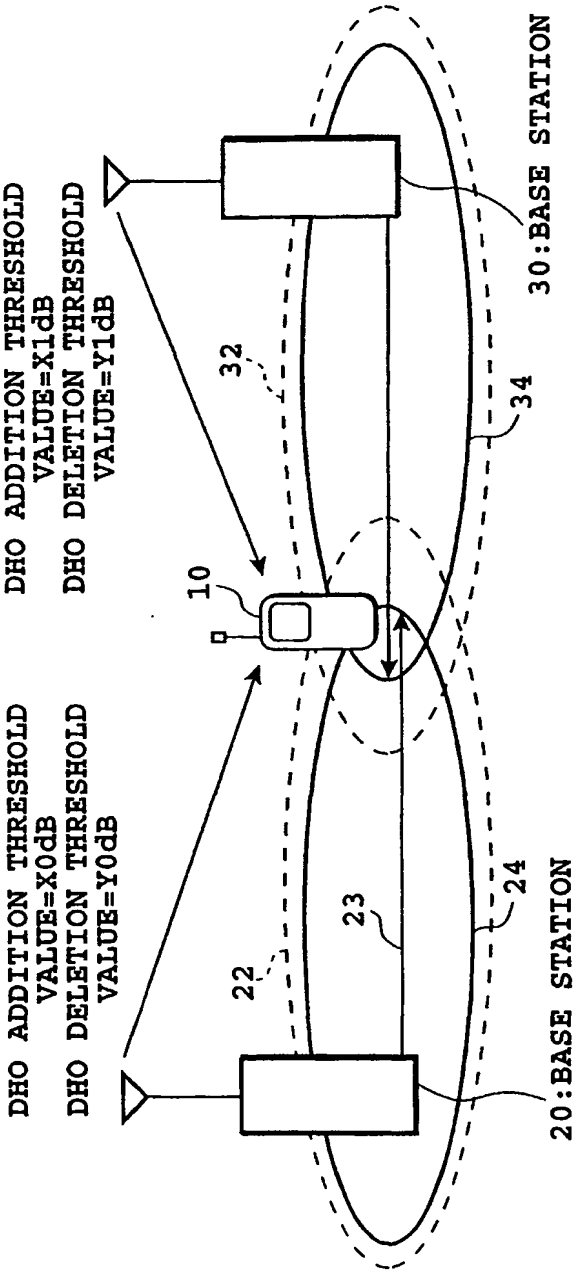
DHO ADDITION THRESHOLD VALUE=X1dB
DHO DELETION THRESHOLD VALUE=Y1dB
DHO ADDITION THRESHOLD VALUE=X0dB
DHO DELETION THRESHOLD VALUE=Y0dB
10
22
23
24
32
34
30:BASE STATION
20:BASE STATION

FIG.4

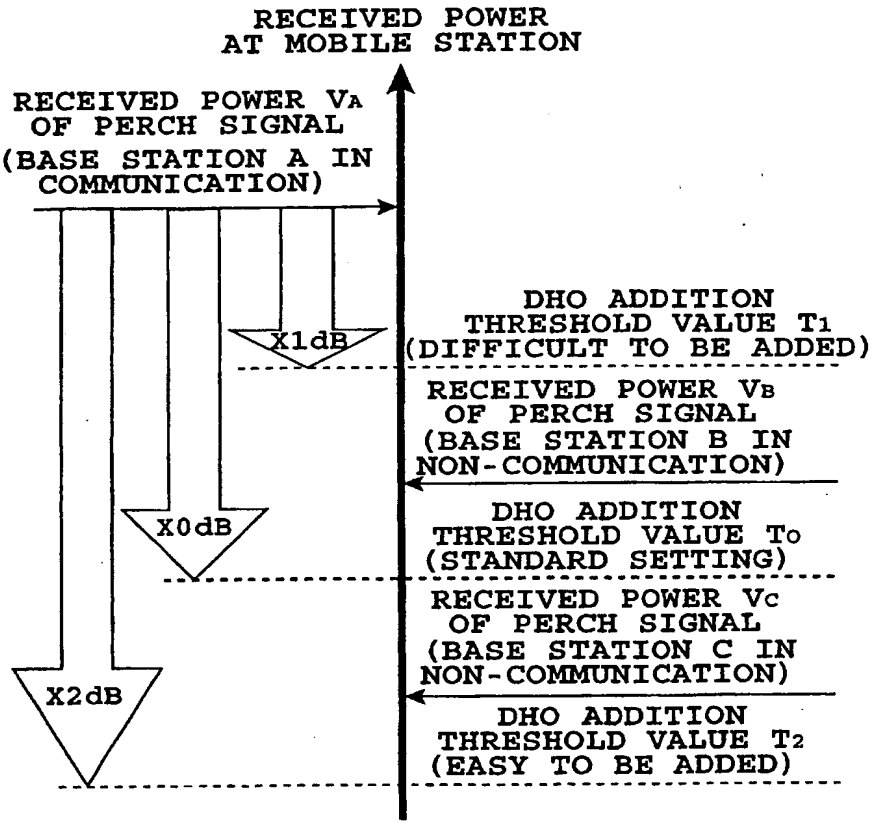
RECEIVED POWER AT MOBILE STATION
RECEIVED POWER VA OF PERCH SIGNAL (BASE STATION A IN COMMUNICATION)
X1dB
DHO ADDITION THRESHOLD VALUE T1 (DIFFICULT TO BE ADDED)
RECEIVED POWER VB OF PERCH SIGNAL (BASE STATION B IN NON-COMMUNICATION)
X0dB
DHO ADDITION THRESHOLD VALUE To (STANDARD SETTING)
RECEIVED POWER Vc OF PERCH SIGNAL (BASE STATION C IN NON-COMMUNICATION)
X2dB
DHO ADDITION THRESHOLD VALUE T2 (EASY TO BE ADDED)

FIG.5

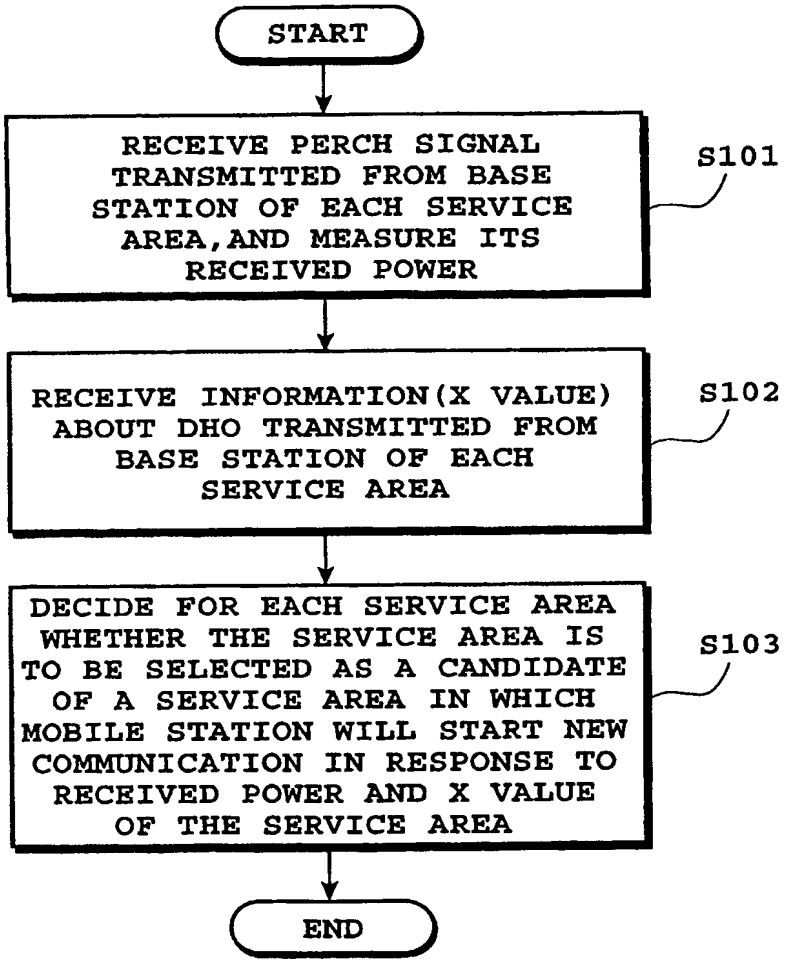
START
RECEIVE PERCH SIGNAL TRANSMITTED FROM BASE STATION OF EACH SERVICE AREA, AND MEASURE ITS RECEIVED POWER
S101
RECEIVE INFORMATION(X VALUE) ABOUT DHO TRANSMITTED FROM BASE STATION OF EACH SERVICE AREA
S102
DECIDE FOR EACH SERVICE AREA WHETHER THE SERVICE AREA IS TO BE SELECTED AS A CANDIDATE OF A SERVICE AREA IN WHICH MOBILE STATION WILL START NEW COMMUNICATION IN RESPONSE TO RECEIVED POWER AND X VALUE OF THE SERVICE AREA
S103
END

FIG. 6

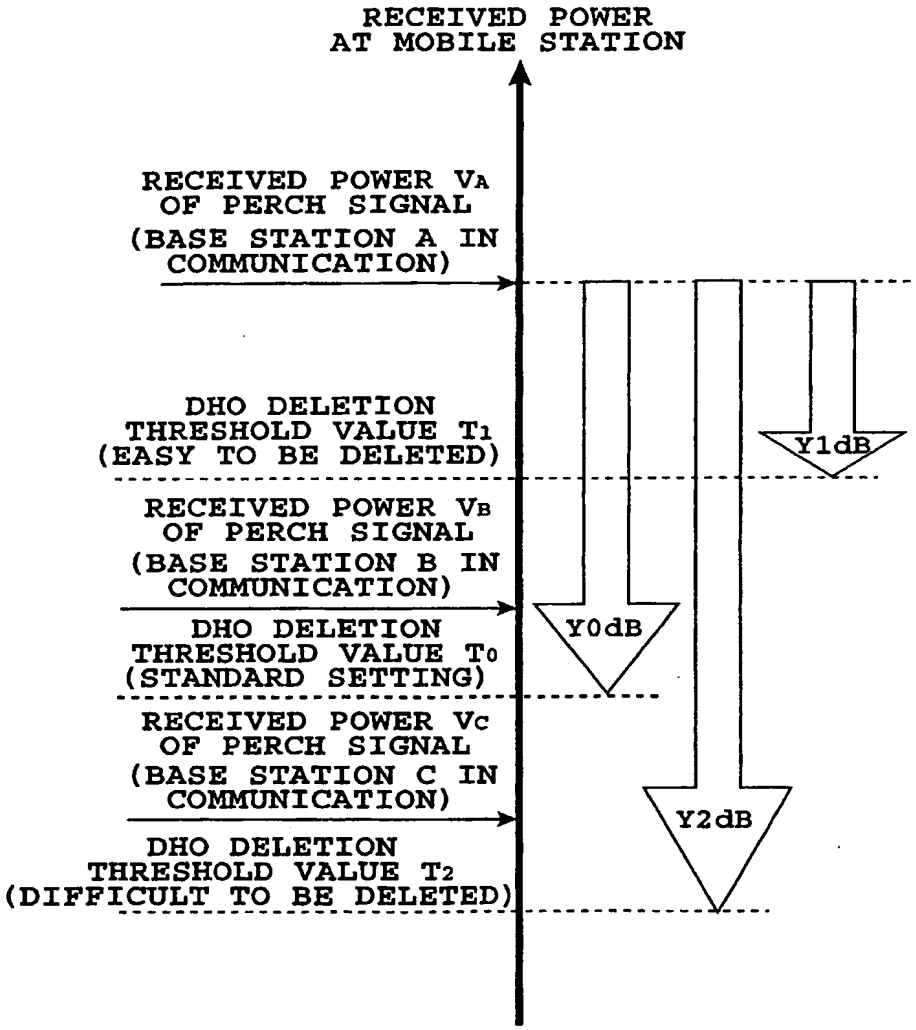
RECEIVED POWER AT MOBILE STATION
RECEIVED POWER VA OF PERCH SIGNAL (BASE STATION A IN COMMUNICATION)
DHO DELETION THRESHOLD VALUE T1 (EASY TO BE DELETED)
RECEIVED POWER VB OF PERCH SIGNAL (BASE STATION B IN COMMUNICATION)
DHO DELETION THRESHOLD VALUE T0 (STANDARD SETTING)
RECEIVED POWER VC OF PERCH SIGNAL (BASE STATION C IN COMMUNICATION)
DHO DELETION THRESHOLD VALUE T2 (DIFFICULT TO BE DELETED)
Y1dB
Y0dB
Y2dB

FIG.7

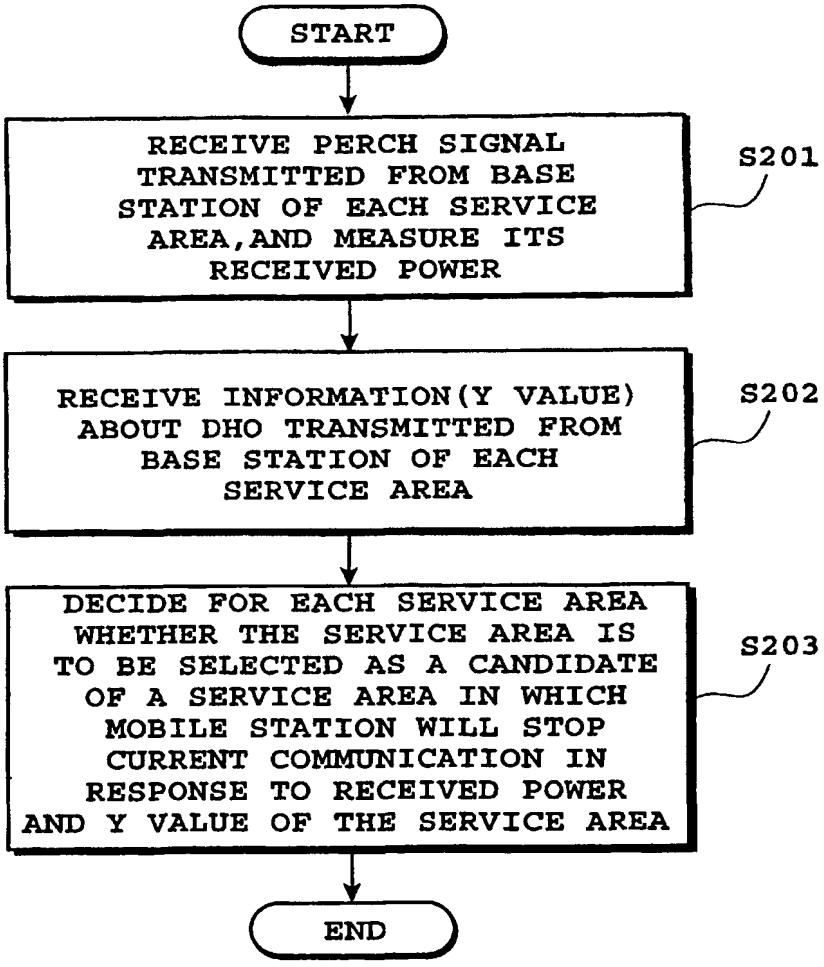
START
RECEIVE PERCH SIGNAL TRANSMITTED FROM BASE STATION OF EACH SERVICE AREA,AND MEASURE ITS RECEIVED POWER
S201
RECEIVE INFORMATION(Y VALUE) ABOUT DHO TRANSMITTED FROM BASE STATION OF EACH SERVICE AREA
S202
DECIDE FOR EACH SERVICE AREA WHETHER THE SERVICE AREA IS TO BE SELECTED AS A CANDIDATE OF A SERVICE AREA IN WHICH MOBILE STATION WILL STOP CURRENT COMMUNICATION IN RESPONSE TO RECEIVED POWER AND Y VALUE OF THE SERVICE AREA
S203
END

FIG.8

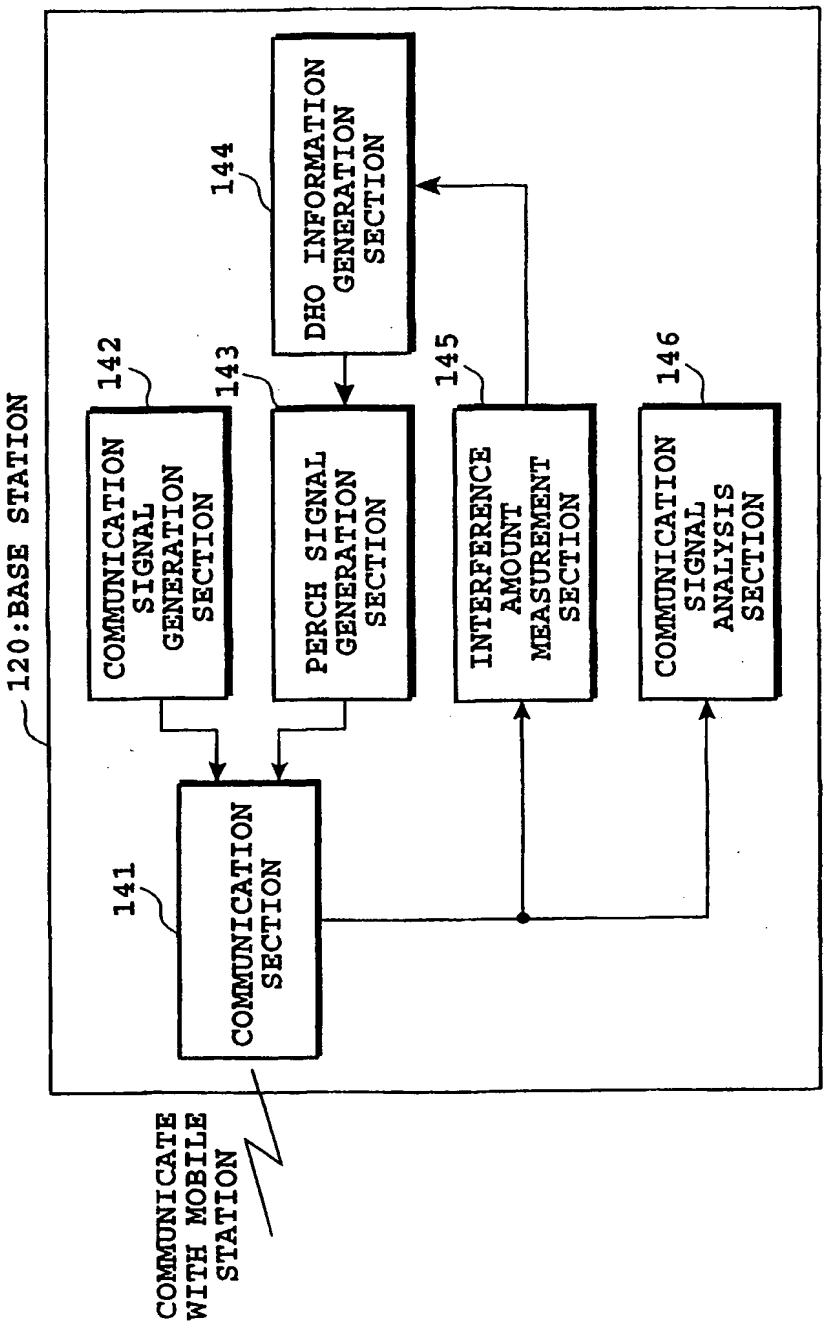
120:BASE STATION
141
COMMUNICATION SECTION
142
COMMUNICATION SIGNAL GENERATION SECTION
143
PERCH SIGNAL GENERATION SECTION
144
DHO INFORMATION GENERATION SECTION
145
INTERFERENCE AMOUNT MEASUREMENT SECTION
146
COMMUNICATION SIGNAL ANALYSIS SECTION
COMMUNICATE WITH MOBILE STATION

FIG. 9

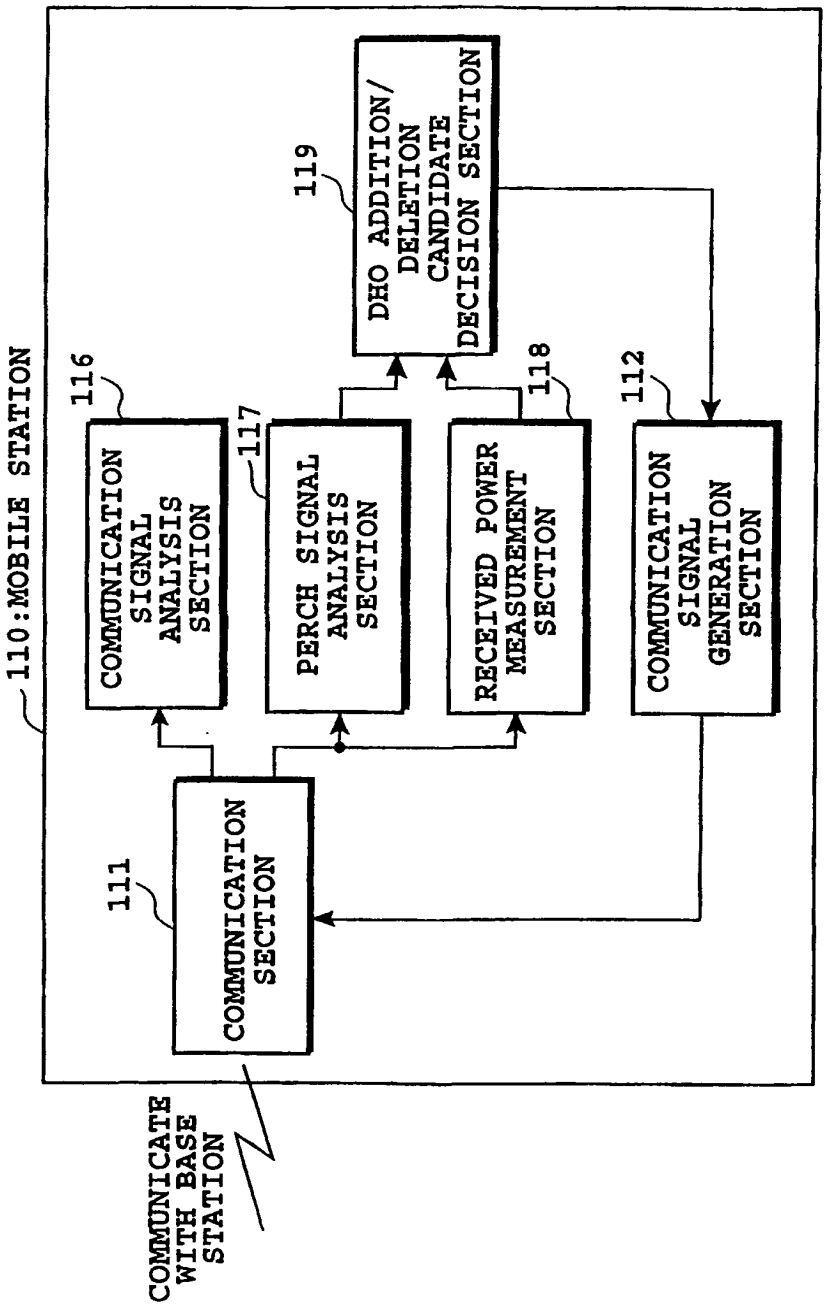
110:MOBILE STATION
COMMUNICATION SIGNAL ANALYSIS SECTION
116
PERCH SIGNAL ANALYSIS SECTION
117
DHO ADDITION/ DELETION CANDIDATE DECISION SECTION
119
RECEIVED POWER MEASUREMENT SECTION
118
COMMUNICATION SIGNAL GENERATION SECTION
112
COMMUNICATION SECTION
111
COMMUNICATE WITH BASE STATION

FIG.10

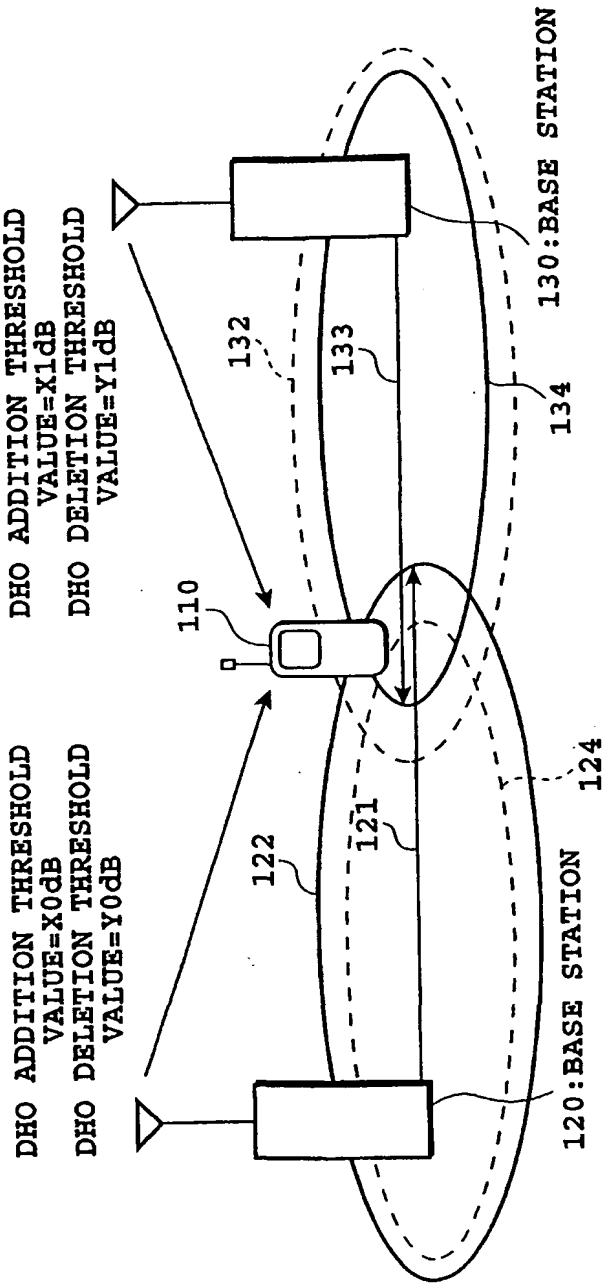
DHO ADDITION THRESHOLD VALUE=X1dB
DHO DELETION THRESHOLD VALUE=Y1dB
DHO ADDITION THRESHOLD VALUE=X0dB
DHO DELETION THRESHOLD VALUE=Y0dB
110
120:BASE STATION
130:BASE STATION
121
122
124
132
133
134

FIG.11

THIS PAGE BLANK (USPTO)